Active Visual Resolution and Geospatial Fixing of Adversary CIWS Platforms for Targeting of IR Laser "Halo Spoofing" from Anti Ship Missile-Deployed Perdix Decoys

2 February 2023
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Introduction

Despite DoD suggestion to the contrary, there is little benefit to utilizing onboard A.I. to make autonomous targeting decisions in the terminal phase of flight when it comes to Anti-Ship Missiles, particularly given the hazards introduced by last-minute course changes i.e. indirect paths increase exposure time as well as increase the exposed surface area of an ASM. Automated visual identification of CIWS of adversary platforms, however, may instead serve as a critical cog in a novel countermeasure system that would take advantage of both visual A.I. and Perdix mini-drone technology as well as IR LASER technology.

Abstract

CIWS systems are programmed to look for "haloes" of infrared light as well as rapidly moving streaks of IR. CIWS need to look for both pattern types because a missile moving straight toward a CIWS will look to its sensors like a halo of IR light. CIWS will always engage halo patterns as their first priority since these are interpreted as attacks against the ship the CIWS is mounted upon and not another ship in the battle group. The larger the black area in the center of the source of IR light, the closer the missile is judged by a CIWS to be. Although CIWS can attempt to protect other ships, the programming language guarantees that the systems will protect their own ship first and foremost. Firing at directly-oncoming missiles has as an added benefit a higher probability of intercept.

Attempting to blind the IR sensors using a LASER emitted from an ASM (Anti-Ship Missile) is self-defeating since the CIWS can be programmed to detect this and fire upon the source of the LASER light just as it fires upon IR signatures associated with engine exhaust.

A better countermeasure approach still employs lasers, but with a twist. Six mini-drones, three on each side, are loaded into the CIWS-defeating ASMs on the sides of the missile behind doors which can pop open just before the terminal phase. The drones are ejected and then rapidly decelerate, assuming a stationary position angularly offset from the true position of the missile. The CIWS-defeating missile visually acquires the exact physical position of the CIWS batteries on the enemy ship, placing their three-dimensional coordinates on a virtual battle grid. The CIWS-defeating missile remains in constant contact with the decoy drones, relaying this information and enabling them to properly direct conical beams of extremely intense IR light toward the specific CIWS platform it is tasked to spoof. The LASERs do not need to have high endurance since they only need to distract the CIWS' attention for a few seconds and the drones themselves are disposable.

The decoys each pick a different CIWS and use the targeting data to decide where to focus a special beam of light that is essentially conical, heating the atmosphere dramatically in what would look to the CIWS to be a halo. The adversary CIWS would then engage the decoys, giving the missile the chance to break through the battle group's defenses.

Conclusion

This approach, although high-tech, may be not only be more expensive than the Chinese solution to the same problem: Causing a missile to suddenly accelerate during the terminal phase by burning the last of its fuel so that none is wasted. American missiles do not have this functionality. Any system programmed to distinguish these decoy IR signatures should be able to overcome that particular countermeasure. That does not preclude the possibility that the decoys could be effective for a short window in the early days of a conflict, however, efficacy would also depend upon the ability to spoof all CIWS platforms simultaneously.